

## SHORTER NOTES

**A New Combination in *Adenophorus* (Polypodiaceae).**—Three genera of grammitid ferns (Polypodiaceae) occur in the Hawaiian Islands: *Adenophorus* Gaudich., *Grammitis* Sw., and *Lellingeria* A. R. Sm. & R. C. Moran (Palmer, *Hawai'i's Ferns and Fern Allies*, University of Hawaii Press, Honolulu, 2002). Although all but one of the Hawaiian species of these genera are endemic, only *Adenophorus* is an endemic genus, with 8–10 species (Bishop, *Brittonia* 26:217–240, 1974; Palmer, 2002; Ranker *et al.*, *Molec. Phylogenet. Evol.* 26:337–347, 2003). *Lellingeria* comprises about 57 species that are mostly Neotropical with a few species in Africa and Madagascar, one endemic to French Polynesia, and one endemic to the Hawaiian Islands. *Grammitis* is a pantropical genus that has often been circumscribed to include 200 or more species (e.g., Parris, pp. 153–157 in K. Kubitzki ed, *The Families and Genera of Vascular Plants*, vol. 1, Springer-Verlag, Berlin, 1990). Primarily based on phylogenetic analyses of plastid DNA sequences, Ranker *et al.* (*Taxon* 53:415–428, 2004) found strong evidence for the polyphyly of *Grammitis s.l.* with the type species of the genus, *G. marginella* (Sw.) Sw., being a member of a small, well-supported clade of about 25 species, all of which are characterized by having black, sclerified leaf margins, a character state that is an autapomorphy for this group of grammitid ferns and, thus, defines the clade. None of the four Hawaiian *Grammitis* species possess black leaf margins and none were supported as members of the black-margined clade in the family-level phylogenetic analyses of Ranker *et al.* (2004). Thus, the Hawaiian *Grammitis* species should be referred to other genera. Parris (*Gard. Bull. Singapore* 58:233–274, 2007) included the Hawaiian *G. baldwinii* (Baker) Copel., *G. forbesiana* W. H. Wagner, and *G. hookeri* (Brack.) Copel. (the last also found in Fiji and Samoa) in *Oreogrammitis* Copel. Those three species were strongly supported with molecular phylogenetic data as a Hawaiian clade that has diverged from within a primarily SW Pacific-Malesian-SE Asian clade (Ranker *et al.*, 2004; Ranker, unpublished data). The fourth species of Hawaiian *Grammitis*, *G. tenella* Kaulf., was not supported as a close relative of other Hawaiian *Grammitis* species, but was strongly supported as sister to *Adenophorus* (Ranker *et al.*, 2003; Ranker *et al.*, 2004).

*Adenophorus* was primarily circumscribed as a distinct genus based on the presence of putatively unique glandular, receptacular paraphyses (Bishop, 1974). Glandular paraphyses do occur on *G. tenella* and were noted by Wagner (*Taxon* 13:56–64, 1964) and Parris (pp. 81–90, in R. J. Johns, ed, *Holttum Memorial Volume*, Royal Botanic Gardens, Kew, 1997), but the apical cell is typically much smaller than those in *Adenophorus* spp. and it has never been suggested that *G. tenella* might be related to *Adenophorus*. A possible reason for this is that *G. tenella* possesses at least a couple of obvious features that readily distinguish it from *Adenophorus* spp., including a very thin rhizome (i.e., ca. < 1.5 mm in diameter vs. > 1.5 mm in *Adenophorus*) with leaves more



separated than is found in most species of *Adenophorus*, and mostly glabrous leaf lamina (vs. lamina with varying densities of glandular hairs in *Adenophorus*). Molecular phylogenetic evidence, however, provides robust support for a sister-taxon relationship between *G. tenella* and the *Adenophorus* clade (Ranker *et al.*, 2003; Ranker *et al.*, 2004). Phylogenetic analyses of sequence variation for the plastid genes *rbcL* and *atp $\beta$*  supported this sister-taxon relationship with 98% parsimony bootstrap support, 1.0 posterior probability Bayesian support, and Bremer support of 7 steps. The well-supported sister group to the *G. tenella* + *Adenophorus* clade includes the monophyletic black-margined *Grammitis* spp. as sister to the monophyletic genus *Cochlidium* Kaulf. Neither of the latter two groups possess glandular, receptacular paraphyses. Thus, even though glandular paraphyses of varying morphology occur in a diversity of grammitid taxa, their presence in *G. tenella* and *Adenophorus* spp. serves as a synapomorphy for that combined clade. Because of this shared feature of glandular, receptacular paraphyses and in light of the highly robust molecular phylogenetic data, I propose the following combination in *Adenophorus*.

***Adenophorus tenellus*** (Kaulf.) Ranker, **comb. nov.**—*Grammitis tenella* Kaulf., Enum. Filic. 84. 1824. TYPE.—OWahu insularum Sandwich., Chamisso s.n. (holotype, LE; photo of holotype at BISH!).

*Specimens examined* at BISH: HAWAIIAN ISLANDS: **Kaua'i**: 1895, A. A. Heller 2215; 1917, C. N. Forbes 1705K; 1969, J. Henrickson 4001; 1955, B. C. Stone 796; 1960, B. C. Stone 3343; 1983, W. Takeuchi Alakai\_192. **O'ahu**: 1923, D. L. Topping 2647; 1984, W. Takeuchi Koolau\_30; 1930, H. St. John 10615; 1932, H. St. John 11688; 1932, H. St. John 12220; 1990, T. A. Ranker *et al.* 1098; 1933, F. R. Fosberg 9429; 1951, A. K. Chock 206. **Moloka'i**: 1948, H. St. John 23419; 1987, D. H. Lorence 5469. **Lana'i**: 1915, G. C. Munro 470; 1935, F. R. Fosberg 12487; 1963, O. & I. Degener 30152. **Maui**: 1984, R. Hobdy 1990; 1976, P. K. Higashino & G. Mizuno 3098. **Hawai'i**: 1954, H. St. John 25395; 1990, T. A. Ranker 1117; 1989, T. A. Ranker 996; 1980, F. R. Fosberg 60552; 1995, K. R. Wood 4723.—TOM A. RANKER, Department of Botany, University of Hawai'i at Manoa, 3190 Maile Way, St. John 101, Honolulu, HI 96822.

**Range Expansion of Two Tropical to Subtropical Ferns, Ladder Brake (*Pteris vittata* L.) and Lace Fern (*Microlepia strigosa* (Thunb. ex Murray) K. Presl.), in the Urban Osaka Bay Area, Western Japan.**—Murakami *et al.* (Amer. Fern J. 97(4):12–24. 2007) reported the clear northward local range shift of the greenhouse weed *Thelypteris dentata* (Forssk.) St. John as an example of range expansion of a tropical species. They estimated this species' dispersal rate as approximately 60 to 100 km over 20 years, or 3 to 5 km per year. This remarkable northward expansion may be rare, but two other tropical to